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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

10/532420

Applicant's or agent's file reference CFL00346WO		FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/JP2004/004842		International filing date (day/month/year) 02.04.2004		Priority date (day/month/year) 04.04.2003
International Patent Classification (IPC) or national classification and IPC C01B31/02				
Applicant CANON KABUSHIKI KAISHA et al.				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 4 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau) a total of 3 sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand 03.11.2004		Date of completion of this report 23.02.2005		
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer Arnotte, E Telephone No. +49 89 2399-8573		



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/JP2004/004842

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-43 as originally filed

Claims, Numbers

1-8, 12-16 as originally filed

9-11 as amended (together with any statement) under Art. 19 PCT

Drawings, Sheets

1-6 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/JP2004/004842

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-16
	No: Claims	
Inventive step (IS)	Yes: Claims	1-16
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-16
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/JP2004/004842

Novelty

None of the documents of the search report disclose a process for the manufacture of hexagonal flaky carbonaceous particles.

Hence process claims 9-16 are regarded as being novel over the said prior art.

Inventiveness

It is considered that on the one hand, a carbonaceous material with a flaky hexagonal shape and a side length of 0.1-100 micron and a thickness of 10 nm-1 micron, and having excellent high electron conductivity as well as excellent electron emission performance was not derivable from the prior art literature; and on the other hand that a process for obtaining the same was not derivable from the said prior art either.

Hence present claims 1-16 are regarded as being inventive over the said prior art.

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to 0.219 nm and 0.199 to 0.209 nm, respectively.

8. The carbonaceous particle according to any one of claims 1 to 7, which contains iron element and at least one of sulfur element and oxygen element.

5 9. A method of producing the hexagonal, flaky carbonaceous particle set forth in any one of claims 1 to 8, comprising the step of reacting (a) a carbon-containing compound, and at least (b) iron or an iron compound, and (c) at least one of an oxygen-
10 containing compound and a sulfur-containing compound, at a pressure within the range of 2.5 to 60 MPa and at a temperature within the range of 80 to 800°C.

 10. A method of producing the hexagonal, flaky carbonaceous particle set forth in any one of claims
15 1 to 8, comprising the step of reacting (a) a carbon-containing compound, and at least (b/c) iron and a sulfur-containing compound, or an iron compound and a sulfur-containing compound, and (d) a medium, at a pressure within the range of 2.5 to 60 MPa and at a
20 temperature within the range of 80 to 800°C.

 11. A method of producing the hexagonal, flaky carbonaceous particle set forth in any one of claims 1 to 8, comprising the step of reacting (a) a carbon-containing compound, and at least (b/c) iron and an
25 oxygen-containing compound, or an iron compound and an oxygen-containing compound, at a pressure within the range of 2.5 to 60 MPa and at a temperature

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claims 9 to 15, wherein the produced carbonaceous particle contains iron element and at least one of sulfur element and oxygen element.

17. The method of producing the hexagonal,
5 flaky carbonaceous particle set forth in any one of
claims 9 to 16, further comprising adding (d) at
least one medium selected from the group consisting
of carbon dioxide, an alcohol, an ether, a
hydrocarbon, water, and an inert gas to the starting
10 compounds (a), (b) and (c).

AMENDED CLAIMS

[received by the International Bureau on 31 August 2004 (31.08.04)
original claims 9, 10, and 11 amended
original claims 17 cancelled;
other claims 1-8, 12-15 and 16 remain unchanged (3 pages)]

to 0.219 nm and 0.199 to 0.209 nm, respectively.

8. The carbonaceous particle according to any one of claims 1 to 7, which contains iron element and at least one of sulfur element and oxygen element.

5 9. (Amended) A method of producing the hexagonal, flaky carbonaceous particle set forth in any one of claims 1 to 8, comprising the step of reacting (a) a carbon-containing compound, and at least (b) iron or an iron compound, and (c) at least
10 one of an oxygen-containing compound and a sulfur-containing compound, and (d) at least one medium selected from the group consisting of carbon dioxide, an alcohol, an ether, a hydrocarbon, water, and an inert gas, at a pressure within the range of 2.5 to
15 60 MPa and at a temperature within the range of 80 to 800°C.

10. (Amended) A method of producing the hexagonal, flaky carbonaceous particle set forth in any one of claims 1 to 8, comprising the step of
20 reacting (a) a carbon-containing compound, and at least (b/c) iron and a sulfur-containing compound, or an iron compound and a sulfur-containing compound, and (d) at least one medium selected from the group consisting of carbon dioxide, an alcohol, an ether, a
25 hydrocarbon, water, and an inert gas, at a pressure within the range of 2.5 to 60 MPa and at a temperature within the range of 80 to 800°C.

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11. (Amended) A method of producing the hexagonal, flaky carbonaceous particle set forth in any one of claims 1 to 8, comprising the step of reacting (a) a carbon-containing compound, and at
5 least (b/c) iron and an oxygen-containing compound, or an iron compound and an oxygen-containing compound, and (d) at least one medium selected from the group consisting of carbon dioxide, an alcohol, an ether, a hydrocarbon, water, and an inert gas, at a pressure
10 within the range of 2.5 to 60 MPa and at a temperature

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claims 9 to 15, wherein the produced carbonaceous particle contains iron element and at least one of sulfur element and oxygen element.

17. (Cancelled)

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